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ABSTRACT

Performance objectives are stated for both of the secondary school units included in this package of instructional guides prepared for the Dade County Florida Quinmester Program. The two units are "General Geology" and "General Earth Science." The first unit is for students intending to do further course work in geology. The second covers the broad areas of geology, meteorology, astronomy, and conservation to interest the student in further study. These outlines contain suggestions for reference and instructional materials, such as films, slides, models, and transparencies. Projects, experiments, and investigations which may be performed are also included. A master sheet showing the relationship of each suggested activity to the objectives of the package is appended to each booklet. (TS)

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AUTHORIZED COURSE OF INSTRUCTION FOR THE QUINMESTER PROGRAM

SCIENCE

General Geology

(Experimental)

5311.28
5312.28
5313.28
5343.03

DADE COUNTY PUBLIC SCHOOLS

DIVISION OF INSTRUCTION • 1971

GENERAL GEOLOGY

5311.28
5312.28
5313.28
5343.03
SCIENCE

(Experimental)

Written by Jim O'Connor
for the
DIVISION OF INSTRUCTION
Dade County Public Schools
Miami, Florida
1971

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Miami, Florida 33132

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GENERAL GEOLOGY

COURSE DESCRIPTION

A general introductory course in geology including

1. Earth's core
2. Land forms
3. Minerals
4. Rocks
5. Water cycle and its relationship to land forms
6. Stream development
7. Erosion
8. Soil development

The conceptual framework for the course is based upon the following observable and/or detectable physical phenomena:

1. The earth's core is subjected to many forces which produce changes that may be observed internally and externally.
2. The face of the earth is constantly changing thus creating new or different land forms or minerals.

ENROLLMENT GUIDELINES

By design, the course is elective, laboratory oriented and coupled with outdoor excursions for the student who may be interested in pursuing additional coursework in geology.

STATE ADOPTED TEXTS

Brandwein, Strollberg and Burnett. Matter: Its Forms and Changes.
New York: Harcourt, Brace and World, 1968.

Brown, et al. Earth Science.
Morristown, New Jersey: Silver Burdett Co., 1970.

Namowitz and Stone. Earth Science: The World We Live In.
American Book Co., 1969.

Thurber and Kilburn. Exploring Earth Science.
Boston: Allyn and Bacon, Inc., 1970.

PERFORMANCE OBJECTIVES

1. Given lists of descriptions for branches of geology and geological equipment, the student will match the equipment with its respective branch.

2. Given a topographic map for the area in which the student's school is located, the student is to prepare a cross section profile that passes through the school building.

3. Given composite views depicting gradation of a hypothetical area and the student's area, the student is to identify the relief features and the forces of gradation at work.

4. Given a cross-sectional illustration of the earth depicting the lithospheric, hydrospheric and atmospheric features of the hydrologic cycle, the student is to design an enclosed and functioning model that will demonstrate the cycle.

5. Given data on the layers that make up the earth, the student is to construct a three dimensional, cut-away, shaded and labeled model of the earth's interior.

6. Given two dimensional, cross-sectional drawings of intrusive volcanism and extrusive volcanism, the student will prepare an illustration that depicts the use of one with economic value.

7. Given data on deformation and displacement, the student will discover geographical locations.

8. Given a world map showing the belts of major earthquake and volcanic activity, the student is to suggest a reason for the overlapping.

9. Given an identification key based on physical and chemical properties, the student will identify by name samples of minerals.

10. Given known examples of igneous, sedimentary and metamorphic rocks, the student is to prepare field classification guides that stress the relationship of formation to texture or composition.

11. Given scenes depicting weathering, the student will differentiate the events as either physical weathering or chemical weathering.

12. Given a drawing of a soil profile and randomly arranged information that pertains to the formation and composition of the horizons, the student will match the information with its respective horizon.

PERFORMANCE OBJECTIVES (cont.)

13. Given an example of creep, the student will devise a method for establishing the rate of movement.

14. Given the characteristics for the three main categories of the geomorphic cycle and pictorial examples of land areas in various stages of erosion, the student will identify the category for each example.

15. Given an illustration of an artesian system, the student will label the features that are important to an explanation of a functioning artesian well.

16. Given an illustration of a glaciated valley, the student will describe the erosional and depositional features and the processes by which they were produced.

17. Given an illustration and description of a swamp or lake, the student will describe the past and future of the topographic feature.

18. Given illustrations that depict various submarine topographic features and a randomized list of information on marine sediments, the student will describe the sediments that should be associated with each feature.

19. Given descriptions and causes of various offshore deposits, the student will identify illustrations of nearby deposits.

20. Given descriptions of the wind as an agent of erosion, transportation and deposition, the student will prepare drawings to illustrate each of the descriptions.

COURSE OUTLINE

I. Geological Science

A. Areas of geology
1. Geomorphology
2. Seismology
3. Minerology
4. Oceanography
5. Petrography
6. Stratigraphy
7. Hydrology

B. Geological tools
1. Surveying instruments
2. Geophysical instruments
3. Optical instruments
4. Maps and literature

C. The professional geologist

II. Major Divisions of the Earth

A. Lithosphere
1. Processes within the lithosphere
2. Relief features

B. Hydrosphere

C. Atmosphere

III. The Earth's Interior

IV. Volcanism

V. Diastrophism

A. Deformation

B. Displacement

VI. Earthquakes

COURSE OUTLINE (cont.)

VII. Minerals

- A. Chemical properties
- B. Crystals
- C. Physical properties
- D. Silicious
- E. Metal ore

VIII. Rocks

- A. Methods of formation
- B. Types

IX. Weathering

X. Soil

- A. Formation
- B. Profile

XI. Gravity

XII. Streams

XIII. Ground Water

XIV. Glaciers

XV. Lakes and Swamps

XVI. Oceans

- A. Submarine topography
- B. Marine sediments
- C. Shore deposition

XVII. Wind

REFERENCES

1. * Brown, F. Martin et al. Earth Science.
Morristown, New Jersey: Silver Burdett Co., 1970.

2. * Earth Science Curriculum Project. Investigating the Earth.
New York: Houghton Mifflin Co., 1967.

3. * Hibbs, Albert and Eiss, Albert. The Earth Space Sciences.
River Forest, Illinois: Laidlaw Brothers, 1971.

4. Ramsey, William and Burckley, Raymond. Modern Earth Science.
New York: Holt Rinehart and Winston, 1965.

5. Wolf, C. Wroe et al. Earth and Space Science.
Boston: D. C. Heath and Company, 1966.

*State Adopted Texts

INVESTIGATIONS

ESCP. Investigating the Earth. Houghton and Mifflin Co., 1967.

1. The Ice Age Puzzle (p. 448)
2. Factors in Stream Erosion (p. 279)
3. Areas of Erosion and Deposition (pp. 457-458)
4. Evaporation (pp. 181-183)
5. The Inside of a Sphere (p. 350)
6. Earthquakes (pp. 318-319)
7. Rocks and Minerals (p. 39)
8. Rock Cores (p. 332)
9. Weathering (p. 274)
10. Deposition of Sediments (p. 292)

Hibbs and Eiss. The Earth Space Sciences. Laidlaw Brothers, 1971.

11. Seismograph (p. 243)
12. Crystals (p. 417)
13. Rock Analysis (p. 268)
14. Movement of Earth Materials (p. 467)
15. Glacial Flow (p. 311)
16. Submarine Canyon (p. 334)

Buschke, et al. The Earth Space Sciences Laboratory Manual. Houghton Mifflin Co., 1971.

17. Topographic Mapping (p. 89)
18. A Simple Seismograph (p. 79)
19. Identifying Minerals (p. 121)
20. Igneous and Metamorphic Rock (p. 123)
21. Sedimentary Rock (p. 127)
22. Mechanical and Chemical Weathering (p. 133)
23. Evidence of Glaciers (p. 93)
24. Coring (p. 97)
25. Effects of Wave Action on Beaches (p. 95)

VIDEOTAPES

South Florida Environmental Science
Media Unit XIV South Florida Geology — Check
1. Subtopic D: Contours and Layers — AV Supplement

South Florida Environmental Science
Media Unit XV South Florida Geology — Check
2. Subtopic D: The Deep Disposal Well — AV Supplement

DADE COUNTY 16 mm FILMS

1.	Birth of the Soil	AV#1-03696
2.	Birth of a Volcano	AV#1-01993
3.	Bryce Canyon National Park	AV#1-04981
4.	Erosion: Leveling the Land	AV#1-10966
5.	Glacier Park Studies	AV#1-12285
6.	The Making of the River	AV#1-02041
7.	Mountain Waters	AV#1-11439
8.	The Story of Soil	AV#1-03718
9.	Understanding Our Earth: Glaciers	AV#1-02023
10.	Understanding Our Earth: How Its Surface Changes	AV#1-02018
11.	Understanding Our Earth: Rocks and Minerals	AV#1-01980
12.	Understanding Our Earth: Soil	AV#1-03706
13.	Water Supply	AV#1-03582
14.	Challenge of the Oceans	AV#1-30366
15.	Land Forms and Human Use	AV#1-02034
16.	Rocks That Originate Underground	AV#1-30387
17.	Rocks and Gems	AV#1-02160
18.	Rocks That Form on the Earth's Surface	AV#1-11019
19.	Waves on Water	AV#1-10987
20.	The Earth: Changes in Its Surface	AV#1-02012
21.	The Earth: Its Structure	AV#1-01996
22.	Earthquakes	AV#1-02008
23.	Earthquakes and Volcanoes	AV#1-10956
24.	Lava and the River	AV#1-10962
25.	The Mountain of Fire	AV#1-02000
26.	Restless Sea Part I	AV#1-30369
27.	Restless Sea Part II	AV#1-30371
28.	River of Ice: Life Cycle of a Glacier	AV#1-02038
29.	Why Do We Still Have Mountains	AV#1-10976

DADE COUNTY 16 mm FILMS (cont.)

30.	Cascade Mountains	AV#1-10975
31.	Crystal Gazing	AV#1-10949
32.	The Earth in Evolution	AV#1-01994
33.	Eruption of Kilauea, 1955	AV#1-10961
34.	Eruption of Kilauea, 1959-60	AV#1-30361
35.	Face of the Earth	AV#1-01983
36.	Geyser Melodies	AV#1-02027
37.	Geysers and Hot Springs	AV#1-02029
38.	Glaciers	AV#1-02016
39.	The Great Lakes: How They Were Formed	AV#1-00856
40.	Ground Water	AV#1-02030
41.	The Hidden Earth	AV#1-30358
42.	Journey Into Time	AV#1-10630
43.	The Land of the Pink Snow	AV#1-30362
44.	Mount Rainier	AV#1-02017
45.	Mountain Stream	AV#1-04124
46.	Our Soil Resources	AV#1-03703
47.	Science of the Sea	AV#1-10986
48.	Surface of the Earth	AV#1-02042
49.	Volcano	AV#1-10964
50.	Volcanoes in Action	AV#1-02003
51.	Work of Rivers	AV#1-02026
52.	A World Is Born	AV#1-10631
53.	Yellowstone	AV#1-12286
54.	Yosemite	AV#1-12292
55.	Zion National Park	AV#1-04983
56.	South Florida Environmental Science Media Unit XIV South Florida Geology Subtopic E: Timeline	Check AV Supplement

DADE COUNTY MODELS

1.	Elementary Land Forms	AV#6-00173
2.	Florida Rocks & Minerals	AV#6-00129
3.	Geology Models	AV#6-00172
4.	Igneous Rocks and Florida Minerals	AV#6-00120
5.	Iron Ore Sample Kit	AV#6-00081
6.	Phosphate Exhibit	AV#6-00048
7.	Rocks and Minerals	AV#6-00116
8.	Sedimentary and Metamorphic Rocks	AV#6-00119
9.	Soils of Florida	AV#6-00032
10.	The Story of Rocks	AV#6-00128

DADE COUNTY SLIDES AND FILMSTRIPS

1.	Carlsbad Cavern National Park	AV#5-20131
2.	Crystals: Their Form and Color Set 1	AV#5-20015
3.	Crystals: Their Form and Color Set 2	AV#5-20005
4.	Geology Set 1 (50 slides in two magazines)	AV#5-70022
5.	Geology Set 2 (50 slides in two magazines)	AV#5-70023
6.	Geology Set 3 (50 slides in two magazines)	AV#5-70024
7.	Hawaii's 1955 Volcano Eruptions	AV#5-20065
8.	Mount Rushmore Memorial	AV#5-20128
9.	Mount Rushmore National Monument	AV#5-20129
10.	Rocks and Rock Formations Part I	AV#5-20011
11.	Rocks and Rock Formations Part II	AV#5-20056
12.	Swamp Scenery	AV#5-20094

South Florida Environmental Science
Media Unit XIV South Florida Geology

13.	Subtopic A: Soil Formation Part I	Check AV Supplement
14.	Subtopic B: Soil Formation Part II	" " "
15.	Subtopic C: The Salt Problem	" " "

South Florida Environmental Science
Media Unit XV South Florida Geology

16.	Subtopic A: Mineral Springs	Check AV Supplement
17.	Subtopic B: Using Artesian Water	" " "
18.	Subtopic C: Geology Field Trip	" " "

DADE COUNTY TRANSPARENCIES

1.	Earth Science: Geology Set 1 (18 Transparencies)	(Hubbard Science)	AV#2-30147
2.	Earth Science: Oceanography Set 1 (4 Transparencies)	(Hubbard Science)	AV#2-30150
3.	Drainage Basins	(Aero Service)	AV#2-00296
4.	Major Land Forms	(Aero Service)	AV#2-00270
5.	Mapping a Small Area: Unit 4	(EBEC)	AV#2-00264
6.	Metals	(Aero Service)	AV#2-00275
7.	Physiographic Divisions	(Aero Service)	AV#2-00282
8.	Reading Topographic Symbols: Unit 2	(EBEC)	AV#2-00262
9.	Soil Composition	(Tecnifax)	AV#2-00144
10.	Evolution of North America, The: Key to Rock Types	(Gen. Aniline)	AV#2-00315
11.	Weather: The Water Cycle	(Drago)	AV#2-00255

SPEAKERS

Marine Geologists

1. Rosenstiel School of Marine and Atmospheric Science
   Jean Yehle
   Public Relations Officer
   10 Rickenbacker Causeway
   Miami, Florida 33149

Geologists

2. Miami Geological Society
   10 Rickenbacker Causeway
   Miami, Florida 33149

Hydrologists

3. U. S. Geological Survey
   Water Resources Division
   51 S. W. 1st Avenue
   Room 730
   Miami, Florida 33130

Soil Chemists

4. Homestead Agricultural Center
   18710 S. W. 288 Street
   Homestead, Florida 33030

FIELD TRIPS

5. Silver Bluff, South Bayshore Drive and 17 Avenue
   Wave-cut sea cliff, cross bedding and oolitic limestone ridge

6. Old Cutler Road and S. W. 84 Street
   Ancient tidal channels

7. Krome Avenue - one quarter of a mile south of Kendall Drive
   Bryozoan limestone in canal spoil banks

8. Mineral Springs - west of Krome Avenue in Grossman Hammock

MATERIALS TO PURCHASE

Books			
1.	The Birth and Development of the Geological Sciences	2.75	Dover Publications
2.	Giants of Geology	4.50	Doubleday
3.	Our Earth: Geology and Geologists	3.64	Putnam's Sons
4.	Golden Nature Guide Rocks and Minerals	4.95	Western Publishing
5.	The Rock Hunter's Field Manual	4.50	Harper & Row
6.	Life Science Library: Water	3.95	Time Inc.
7.	Life Nature Library: Earth	3.95	Time Inc.
Charts			
8.	Important Minerals	8.00	Society for Visual Education
9.	Common Rocks	8.00	Society for Visual Education
Equipment			
10.	Mineral Set	5.00 & 10.00	Milton Bradley
11.	Rock Abrasion Kit	1.30	Damon Engineering
Filmstrips			
12.	Diastrophism	6.00	Popular Science
13.	Field Identification of Minerals	6.00	Popular Science
14.	Laboratory Analysis of Minerals	6.00	Popular Science
15.	Life & Death of Fresh Water Lakes	6.00	Popular Science
16.	Minerals: How They Are Identified	6.00	Popular Science
Filmstrips - sound			
17.	Making a Geologic Map	9.00	Encyclopaedia Britannica
18.	Measuring the Shape of the Land	9.00	Encyclopaedia Britannica
Globes			
19.	Hydrographic Relief Globe (Land)	39.50	Cenco Educational Aids
20.	Hydrographic Relief Globe (Ocean)	39.50	Cenco Educational Aids
21.	Physiographic Relief Globe	14.95	Denoyer-Geppert
Kits			
22.	Fracture Collection	8.50	Ward's Natural Science
23.	Moh's Hardness Scale Collection	4.00	Ward's Natural Science
24.	Contour Model Kits	24.00	Wilkins-Anderson
25.	Rock Composition Kits	9.75	Wilkins-Anderson
26.	Soil Profile Kits	5.25	Wilkins-Anderson

MATERIALS TO PURCHASE (cont.)

Maps

27.	Set 12 U.S. Geological Survey Quadrangles	45.00	A. J. Nystrom
28.	U.S.G.S. Quadrangles Raised Relief	45.00	A. J. Nystrom

Models

29.	Demonstration Models of Geological Faulting	83.85	Ward's Natural Science
30.	Seismograph Model	8.00	Wilkins-Anderson
31.	Set of 4 - Dome Mountains Continental Glaciation Folded Mountains Coastal Plain	75.00	Stansi Scientific
32.	Set of 4 - Shoreline of Submergence Volcanoes Block Mountains Alpine Glaciation	75.00	Stansi Scientific

Specimens

33.	Erosion and Rock Structure	2.75	Sargent-Welch Scientific
34.	General Collection of Rocks & Minerals	4.25	Sargent-Welch Scientific
35.	How Soils are Formed	2.75	Sargent-Welch Scientific

Study Prints

36.	Geological Instruments	6.95	A. J. Nystrom
37.	Geological Instruments	7.95	Ward's Natural Science

Super 8mm Loops

38.	Master Erosion Cycle	20.00	Cenco Educational Aids
39.	Meandering River	18.50	Doubleday
40.	Vulcanism	21.50	Cenco Educational Aids
41.	Geology Weathering	20.00	Bailey-Film Assocation

Transparencies

42.	Glaciation	3.95	Denoyer-Geppert
43.	A Cross Section of the Earth	4.25	Tweedy Transparency
44.	Earth's Core	----	Stansi Scientific
45.	Artesian Water	4.00	NASCO
46.	Earthquakes and Volcanoes	4.25	A. J. Nystrom
47.	Swamp Filling	4.00	NASCO
48.	Valley Development	4.25	A. J. Nystrom

MASTER SHEET - GENERAL GEOLOGY

Objectives	References	Investigations	Video Tapes	Films	Models	Slides and Filmstrips	Transparencies	Speakers And Field Trips	Materials to Purchase
1	3 pp.29-33 3 pp.241-243	11						2	1,2,3, 36, 37
2	4 pp.131-139 5 pp.21-23	1, 17	1				5, 8	6	17,18,24, 27,28
3	2 pp.283-287 3 pp.300-316 4 pp.232-233 5 Ch. 8	2, 3		3,4,10, 15,29, 30,32, 35,52	1,3,5	4, 6	1, 4		19,20,21 33, 38
4	1 p.122 2 p.180 3 pp.227-228 4 pp.470-472	4		47		1, 15	11		
5	1 pp.473-477 2 pp.356-357 3 pp.258-273 4 pp.88-93	5		21,41			1		43
6	1 pp.430-432 4 Ch. 16			2,20, 24,25, 30,33, 34,36, 37,50, 53	1,3,5	4,6,7	1		40,44
7	1 pp.421-428 2 pp.316-317 4 Ch. 13 5 Ch. 12			5,29, 42	1,3,	4,5,6	1, 3		12,29,31 32
8	1 pp.440-456 2 pp.320-321 4 pp.239&296 5 Ch. 5 & 11	6, 18		19,22, 23,49, 54		4,5,6,7	2		7,30,46
9	3 pp.415-419 4 Ch.11 5 Ch. 4	7,12,19		17,31	2,4,5, 6,7	2,3	1, 6		4,8,10,13, 14,16,22, 23,33
10	1 pp.53-57 2 pp.332-344 3 pp.266-268 3 pp.419-429 4 Ch. 12 5 Ch. 6,9,10	8,13,20,21		11,16, 18,56	2,4,7, 8, 10	8,9,10, 11, 18	1, 10	5, 7	4,5,9,20, 25,34
11	1 pp.111-115 2 pp.270-274 3 pp.465-466 4 pp.307-310	9, 22		3,4,5, 29,46, 55		6,13,14			11,41
12	1 p.111 2 p.275 4 pp.312-322			1,8, 12,46	9	4,5,13,14	9	4	26, 35
13	1 pp.110-111 3 p.467	14				5, 6			

MASTER SHEET - GENERAL GEOLOGY (con't)

Objectives	References	Investigations	Video Tapes	Films	Models	Slides and Filmstrips	Transparencies	Speakers And Field Trips	Materials to Purchase
14	1 pp.428-430 3 p.314 4 pp.244-245 5 Ch 14			3,6, 13,24, 45,51	1,3,5	4,5,6	1, 3		6,30,48
15	1 p.230 4 pp.476-478 5 pp.181-182		2	40		5,16,17	1	3, 8	45
16	1 pp.256-276 4 pp.353-361 5 pp.204-205	15,23		5,9, 24,28, 30,38, 43,44, 48	1, 3	4,5,6	1		42
17	1 pp.280-283 4 pp.481-488			5,7, 39		5,6,12			15,47
18	1 pp.387-403 2 pp.321-326 3 pp.328-336 4 pp.262-263 4 pp.496-500 5 Ch. 39	10,16,24		14,26, 27,47			2	1	
19	4 pp.376-377 5 pp.213-216	25			1, 3	4,6	1	1	
20	1 pp.304-307 4 pp.370-374 5 Ch.18			3,4. 24,29		4,5,6			

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DADE COUNTY PUBLIC SCHOOLS

GENERAL EARTH SCIENCE

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DIVISION OF INSTRUCTION • 1971

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GENERAL EARTH SCIENCE

COURSE DESCRIPTION

"Around the Earth in 45 Days" is the other title for this course. It will briefly introduce the main topics of Earth Science. The broad areas to be covered are Geology, Meterology, Astronomy, and Conservation. The course is to interest the student in further study.

ENROLLMENT GUIDELINES

None

STATE ADOPTED TEXTS

1. Wolfe, Battan, Fleming, Hawkins, and Skernik, Earth and Space Science. D. C. Heath and Co., 1966.

2. Earth Science Curriculum Project, Investigating the Earth, Boston: Houghton Mifflin Co., 1967.

3. Namowitz and Stone, Earth Science - The World We Live In. Princeton, New Jersey: American Book Co., 1969.

4. Thurber and Kilburn, Exploring Earth Science. Boston: Allyn and Bacon, Inc., 1970.

5. Brandwein, Stollberg, and Burnett, Matter: Its Forms and Changes, New York: Harcourt,Brace Jovanich, 1968.

6. Ramsey and Burckley, Modern Earth Science. Hew York: Holt, Rinehart, and Winston, 1965.

STATE ADOPTED TEXTS (CONT'D.)

7. Brown, et al., The Silver Burdett Earth Science Program: Earth Science, Morristown, New Jersey: Silver Burdett Co., 1970.

PERFORMANCE OBJECTIVES

1. The student will differentiate the processes of diastrophism, rock weathering, volcanism, earthquakes, glaciers, and erosion.

2. The student will compre two types of land forms.

3. The student, having gathered information on the formation of minerals, will identify five minerals.

4. Given selected fossils, the student will classify them.

5. Given material on cartography and topography the student will construct basic geologic maps.

6. The student will contrast the nature and composition of the layers and gases in the atmosphere.

7. The student will distinguish between the heating and cooling processes in the atmosphere.

8. The student will cite evidence for changes in the atmosphere through pressure and water vapor.

9. Given certain weather instruments the student will use them according to specifications.

10. The student will state how weather predictions are made.

11. The student will relate the earth's motions to its seasons.

PERFORMANCE OBJECTIVES (CONT'D)

12. The student will describe the relationship between the solar system and the universe.

13. Given the fact that the earth's natural resources are being destroyed, the student will give reasons for this conservation problem.

14. The student will give possible solutions for the depletion of our natural resources.

15. Given the interaction and connection of the earth sciences, the student will cite evidences of these relationships.

COURSE OUTLINE

I. Geology

A. Geomorphology
   1. Forces and processes
   2. Rock weathering and gravity
   3. Land forms

B. Mineralogy
   1. Formation of rocks and minerals
   2. Structure
   3. Identification

C. General Geology
   1. Historical geology
   2. Topography and cartography

II. Meterology

A. The Atmosphere
   1. Nature and composition
   2. Heating and cooling
   3. Winds and pressure
   4. Water vapor

COURSE OUTLINE (CONT'D)

B. Weather
   1. Air masses and fronts
   2. Instruments
   3. Weather predictions

III. Astronomy

A. The Earth
   1. Motions
   2. Seasons

B. The Solar System
   1. Origin
   2. Members
   3. Our satellite, the moon

C. The Universe
   1. Structure
   2. Stars and Galaxies

IV. Conservation

A. Natural Resources
   1. Water preservation
   2. Soil conservation
   3. Atmospheric pollution

V. Relationships of the Earth Sciences.

EXPERIMENTS

Earth Science Curriculum Project, Investigating the Earth, Boston: Houghton, Mifflin, Co., 1967.

1. Rocks and Minerals (2-2, p.39)
2. Maps (3-9, p. 76-79)
3. Solar System - Sun (4-1, p.84)
4. Solar System - Sun (7-1, p.156)
5. Heating, Pressure, Winds (7-10, p. 172)
6. Weather - Evaporation (8-2, p. 181)
7. Weather - Dew Point (8-12, p. 200)

EXPERIMENTS (CONT'D)

8. Weather - Maps (8-13, p. 200)
9. Geology - Erosion (12-6, p. 279)
10. Geology - Historical (17-4, p. 378)
11. Geology - Erosion (12-3, p. 458)
12. Solar System (23-4, p. 501)
13. Universe (25-7, p. 547)

Flock, Exercises and Investigations for Modern Earth Science. New York: Holt, Rinehart, and Winston, 1965.

14. Astronomy - Telescope (1-3, p. 15)
15. Maps (2-13, p.27)
16. Topography - Models (2-11, p.34)
17. Geology - Hardness (3-19, p. 43)
18. Geology - Land Forms (4-32, p. 73)
19. Geology - Models (4-22, p. 85)
20. Weathering (5-36, p. 87)
21. Geology - Erosion (5-26, p. 123)
22. Geology - Historical (6-56, pp. 131-132)
23. Weather (8-62, pp. 149-150)
24. Weather - Instruments (8-47, p. 157)
25. Weather (9-51, p. 163)
26. Weather - Map (9-52, pp. 155-156)

Namowitz, Activities in Earth Science (for Earth Science - The World We Live In) Princeton, New Jersey: D. VanNostrand Co., Inc., 1965.

27. Geology - Minerals (p. 5-6)
28. Geology - Rock (pp. 15-25)
29. Mapping (pp. 43-45)
30. Astronomy - Telescope (pp. 87-88)
31. Astronomy (pp. 89-91)

DEMONSTRATIONS

Floch, Exercises and Activities for Modern Earth Science, New York: Holt, Rinehart, and Winston, 1965.

1. Crystalization (p. 61)

Brandwein, Beck, Strahler, Hollingworth, and Brennan, The World of Matter Energy, New York: Harcourt, Brace and World, 1964.

2. Clouds (8-5, p. 139)
3. Water Cycle (#2, p. 143)
4. Water in Air (#3, p. 144)
5. Air Heating (9-5, p. 150)
6. Barometer (10-4, p. 172)
7. Hygrometer (10-6, p. 174
8. Thermometer(10-1, p. 169)
9. Thermometer(12-10, p. 223) (#4, p. 241)
10. Alt-Azimuth Star Finder (22-8, p. 440)

Other topics for possible demonstrations.

1. Eclipse of sun or moon with globes and electric lights.
2. Use of Geiger counter.
3. Water vs. mercury barometer.

Any of the experiments can be used as a demonstration if desired.

PROJECTS

1. Keep a journal of the daily weather.

2. Make a simple weather instrument.

3. Keep a daily log of cloud types.

4. Track a hurricane on a weather map.

5. Photograph and name clouds.

6. Study the changes that take place during a hurricane.

7. Construct a three-dimensional model of a frontal cloud system.

8. Construct a diagram showing the relative sizes and positions of the sun and planets.

9. Chart the nightly movements of a planet or star.

10. Chart constellation at the same hour each night for several nights.

11. Make a simple telescope.

12. Construct and interpret a picture showing how a total and partial solar eclipse of the sun occur.

13. Make models to show how erosion can be prevented.

14. Show how most of the material we use could be recycled and used again.

15. Devise and construct models to show how to prevent air and water pollution.

16. Locate and label places in your neighborhood that show types of weathering.

17. Collect rocks and materials.

18. Make a model of South Florida land forms.

PROJECTS (CONT'D)

19. Make a model to show a contour map.

20. Collect non-metallic materials of economic importance.

21. Make a model of a volcano.

22. Make a map showing the earthquake regions.

23. Construct a complete plaster-clay model of a land form.

REPORTS

1. How do winds from the sea effect the yearly temperature of a city?

2. Why is there so little rain in Death Valley?

3. The use of weather instruments.

4. How are highs and lows related to air masses?

5. The processes in a thunderstorm.

6. How did the solar system or universe began?

7. What's happening in and on the sun.

8. How far has air, water, or land pollution progressed?

9. How can we save our natural resources?

10. A river and its flood plain.

11. Karst topography in Florida.

12. The geology of South Florida.

REPORTS (CONT'D)

13. How is a contour map made?

14. The mineral resources of Florida.

15. The relationships of the different geological processes.

16. How do the earth sciences interact?

FIELD TRIPS

1. Kennedy Space Center.

2. Dade County Planetarium.

3. Dade County Museum of Science.

4. A South Dade County Oolite pit.

5. Pollution Control Board.

6. Dade County Nature Trails - Virginia Key, Greynolds Park.

7. Weather Bureau.

8. Visit to local reservoir.

AVAILABLE FROM DADE COUNTY AUDIOVISUAL CENTER

FILMS

1. Parade of Ancient Life
   AV#1-11016, 15 min., C

2. Land Forms and Human Use
   AV#1-02034, 11 min., C

3. The Earth; Changes in Its Surface
   AV#1-02012, 11 min., C

4. The Earth: Its Structure
   AV#1-01996, 11 min., C

5. Earthquakes and Volcanoes
   AV#1-10956, 13 min., C

6. Rocks and Minerals
   AV#1-01976, 10 min., C

7. Face of the Earth
   AV#1-01983, 12 min., C

8. A World is Born
   AV#1-10631, 20 min., C.

9. Maps and Their Uses
   AV#1-04589, 10 min., C

10. Weather Research
    AV#1-30380, 27 min., BW

11. The Flaming Sky
    AV#1-30324, 29 min., C

12. What Makes Clouds
    AV#1-11002, 19 min., C

13. The Earth: Its Atmosphere
    AV#1-02124, 11 min. C

FILMS (CONT'D)

14. Origins of Weather
AV#1-10994, 13 min., C

15. How Weather is Forecast
AV#1-02080, 11 min., BW

16. Winds and Their Causes
AV#1-02113, 10 min., BW

17. Seasons
AV#1-10657, 14 min., C

18. Our Mr. Sun Part I
AV#1-30322, 33 min., C

19. Our Mr. Sun Part II
AV#1-30325, 33 min., C

20. Understanding Our Universe
AV#1-01534, 11 min., C

21. The Nearest Star
AV#1-30217, 29 min., C

22. The Solar System
AV#1-01543, 11 min., BW

23. Wise Use of Water Resources
AV#1-10207, 13 min., C

24. Our Natural Resources
AV#1-00417, 10 min., C

25. Water
AV#1-05596, 11 min., BW

26. The Earth: Resources in Its Crust
AV# 1-02157, 11 min., C

27. Guarded Treasure
AV#1-05652, 10 min. C.

28. Man's Problems
AV#1-13338, 19 min., C

SLIDES

1. Astronomy: Stars and Planets
   AV#5-20097, 30 frames, C

2. Clouds and Weather,
   AV#5-70019, 40 slides

3. Geology Set # 1
   AV#5-70022, 50 C

4. Rocks and Rock Formation #1
   AV#5,20011, 22 slides, C

5. Rocks and Rock Formation #2
   AV#5-20056, 20 slides, C

MODELS

1. Astronomy Set #1
   AV#6-00162, Museum of Science, 11 models

2. Geology Models,
   AV#6-00172, Denoyer-Gep., 8 models

3. Igneous Rocks and Florida Minerals
   AV#6-00120, Museum of Science, 26 models

4. Rocks and Minerals
   AV#6-00116, Museum of Science, 56 models

TRANSPARENCIES

1. Astronomy
   AV#2-30028, 2 C

2. Earth Science - Astronomy Set #1
   AV#2-30000, 11 C

3. Earth Science - Geology Set #1,
   AV#2-30147, 18 C

4. Earth Science - Map Reading
   AV#2-30148, 4 C

5. Earth Science - Meterology
   AV#2-30149, 9 C

6. Reading Topographic Symbols
   AV#2-00262, 5 C

7. Weather - The Air
   AV# 2-30160 , 4 C

8. See your librarian for the transparencies in school.

ADDITIONAL ACTIVITIES

1. Make or draw

   a. Weather maps
   b. Contour maps
   c. Topographic maps

2. Draw and label the stars in a constellation.

3. Draw a map of the school and the land around it.

4. Have an optional night laboratory to study the stars and constellations.

SUGGESTED DISCUSSION QUESTIONS

1. Why doesn't the earth wear down to a level plain and stay that way?

2. How does weather influence our daily lives?

3. What causes our weather?

4. How does weather relate to the wearing down of the earth?

5. How do minerals and rocks form?

6. What do you think the other planets are like?

7. Is there life on other places in the universe?

8. How did the universe get started and how far does it go?

9. How do the earth sciences interact with each other?

SUGGESTED TIMELINE

Geology - 3 weeks
Meterology - 2 weeks
Astronomy - 2 weeks
Conservation - 1½ weeks
Relationships of Earth Sciences - ½ week

REFERENCES

1. Brandwein, Paul, et al. The World of Matter - Energy. New York: Harcourt, Brace, and World, 1964.

2. Earth Science Curriculum Project. Investigating the Earth. Boston: Houghton Mifflin Co., 1967.

3. Floch, John R. Exercises and Investigations for Modern Earth Science. New York: Holt, Rinehart, and Winston, 1965.

4. Namowitz, Henri J. Activities in Earth Science (for-Earth Science - The World We Live In) Princeton, J. J.: D. Van Nostrand Co., Inc. 1965.

MASTER SHEET - GENERAL EARTH SCIENCE

Objectives	Experiments	Demonstrations	Projects	Reports	Field Trips	Films	Transparencies	Slides	Models	Additional Activities	Discussion Questions
1	9, 11, 19, 20, 21		16, 21, 22	15	4	3, 4, 5, 7, 8	3	3, 4, 5	2		1, 4
2	18, 19		18, 23	10, 11 12	6	2, 4, 7	3	3	2		1, 4
3	1, 17, 27, 28	1	17, 20	14	3	6		4, 5	3, 4		5
4	10, 22				3, 4	1					
5	2, 15, 16, 16, 29		19	13		9	4, 6			1b, 1c 3	
6	25		7	4		10, 11 13	5, 7				3
7	5	2, 5		1		12, 14, 16					2, 3
8	5, 6, 7, 23, 25	2, 3, 4	3, 4, 5, 6	1, 2, 4 5		12, 14, 16		2			2, 3
9	24	6, 7, 8, 9	2	3							
10	8, 26		1		7	15				1a	2
11			12, 10		1, 2	17				4	
12	3, 4, 12, 13, 14, 30, 31	10	8, 9, 11	6, 7	1, 2	18, 19, 20, 21, 22	1	1, 2	1	2, 4	6, 7, 8
13				20, 8	5, 6	23, 24, 25, 26, 28					
14			13, 14, 15	9	5, 6	23, 24, 25, 26, 28					
15				16							9